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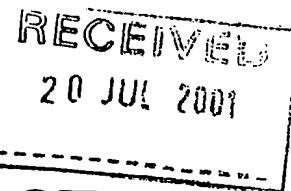
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22147

PATENT COOPERATION TREATY



From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

HARMAN, Michael G.
HILLGATE PATENT SERVICES
No. 6 Aztec Row
Berners Road
Islington, London N1 0PW
GRANDE BRETAGNE

PCT

WRITTEN OPINION

(PCT Rule 66)

408

Date of mailing
(day/month/year)

18.07.2001

7/2001

Applicant's or agent's file reference

/.

REPLY DUE

within 3 month(s)
from the above date of mailing

International application No.

PCT/IB00/01135

International filing date (day/month/year)

21/08/2000

Priority date (day/month/year)

25/08/1999

International Patent Classification (IPC) or both national classification and IPC

A47B61/00

Applicant

BERLINLONDON LIMITED et al.

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 25/12/2001.

Name and mailing address of the international preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Papadimitriou, S

Formalities officer (incl. extension of time limits)

Heimann, C

Telephone No. +49 89 2399 2391



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WRITTEN OPINION

International application No. PCT/IB00/01135

I. Basis of the opinion

1. With regard to the **elements** of the international application (Replacement *sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, pages:

1-12 as originally filed

Claims, No.:

1-3 as originally filed

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed; unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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WRITTEN OPINION

International application No. PCT/IB00/01135

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Claims 1,2,4,5,10

Inventive step (IS) Claims 3,6,7,8,9

Industrial applicability (IA) Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

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Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1) State of the art

Reference is made to the following documents:

D1: US-A-5 135 293 (cited in the application)

D2: US-A-4 783 132

2) Independent claim 1

D1 discloses a locker assembly 20, including at least "first" 24 and "second" 26 neighbouring lockers, cf. figs. 1 and 2, at least the "first" locker 24 including a body forming a compartment having an open side, cf. fig. 6, and a door 30 of generally uniform cross section and of uniform curvature, cf. fig. 6, this curvature lying upon a circle, cf. fig. 6, the door 30 being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered, cf. col. 6, lines 1-10 and fig. 6, there being a cavity between said "first" and "second" lockers, cf. fig. 6, the door's 30 curve remains lying upon the same said circle during rotation, cf. fig. 6, and the cavity being capable of accommodating the door 30 whilst the latter is in the open position.

Therefore, the clarity objection raised in section VIII, first paragraph apart, the present application does not comply with the provisions of Article 33(2) PCT because the subject-matter of independent claim 1 is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

3) Independent claim 4

D2 is directed to a cupboard, cf. col. 1, line 7; fig. 7, including a body 2,4,6 forming a non-cylindrical compartment having an open side, cf. fig. 1, and a door 24,26 of generally uniform cross section, cf. fig. 1, and of uniform curvature, cf. fig. 1, this

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curvature lying upon a circle, cf. in figure 1 the circle having a centre identified by ref. sign 10 and a radius identified by ref. sign 17, the door 24,26 being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, cf. fig. 1, to an open position in which the open side of the compartment is substantially uncovered, cf. fig. 7, the door's curve remaining upon the same said circle during rotation, the door 24,26 being located **substantially outside** the body of the cupboard when the latter is in the open position, cf. fig. 7.

According to the Collins English dictionary a locker is to be understood as a small compartment or drawer that may be locked for safeguarding the contents contained therein. The cupboard specified in D2 is also considered as a small compartment that may be locked.

Therefore, the clarity objection raised in section VIII, second paragraph apart, the present application does not comply with the provisions of Article 33(2) PCT because the subject-matter of independent claim 4 is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

4 Dependent claims 2,3,5-10

These dependent claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

- 4.1) Claim 2: The locker assembly of D1 also includes a covering member 96, cf. figs. 1 and 6.
- 4.2) Claims 3, 5 to 10: These dependent claims also do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT) or inventive step (Article 33(3) PCT), these claims either being already known from D2 (in this respect reference is made to the relevant sections of the search report) or being directed to slight constructional modifications of the group of lockers specified in claim 1, respectively the locker specified in claim 4, these constituting standard design procedures followed by persons skilled in the art, especially as

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the advantages thus achieved can readily be foreseen.

Re Item VII

Certain defects in the international application

1) Dependent claim 3

The appendancy of claim 3 to claim 1 is incorrect since the covering member has no structural antecedent in claim 1, cf. Rule 6.4(b) PCT. ✓

2) Description

2.1) According to the requirements of Rule 11.13(m) PCT the same feature shall be denoted by the same reference sign throughout the application. This requirement is not met in view of the use of 38, cf. page 6, line 28 "nylon glider 38"; page 7, line 13: "handle". ✓

2.2) According to the requirements of Rule 11.13(l) reference signs not appearing in the description shall not appear in the drawings, and vice versa. This requirement is not met in view of the reference sign 31, cf. page 6, ref. 45, cf. page 9, refs. 33, 39 and 14, cf. figures 3 and 4. ✓

2.3) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.

3) All claims

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

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Re Item VIII

Certain observations on the international application

1) Independent claim 1

Claim 1 is unclear and open to objection under Article 6 PCT in the following respects in the order in which they arise in the claim:

i) The expression **or the like** is vague and indeterminate in scope.

ii) The cavity is specified as being suitable for accommodating the door when the latter is in the **closed** position, i.e. in the position where the door covers the opening of each locker of the group. This is in contrast with what is depicted in figure 1 of the application, wherein cavity 21 accommodates the door 20 when the latter is in the open position.

2) Independent claim 4

The passage reading "the door being **substantially outside** the body of the locker when the locker is in the open position" is unclear. It is considered that what was intended was to specify that in the open position the door is disposed at the exterior of the locker rather than in the interior thereof.

3) Claims 11 to 13

The claims are vague and indeterminate in scope as they do not clearly and succinctly specify the features of the locker or group of lockers. These claims should be deleted from the application, cf. Article 6 PCT.

4) General points

- 4.1) In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to **clearly identify** the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to **indicate the passages**

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of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).

If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.

- 4.2) The applicant is requested to file amendments by way of replacement pages in the manner stipulated by Rule 66.8(a) PCT. In particular, fair copies of the amendments should be filed preferably in triplicate.

Moreover, the applicant's attention is drawn to the fact that, as a consequence of Rule 66.8(a) PCT the examiner is not permitted to carry out any amendments under the PCT procedure, however minor these may be.

- 4.3) Any information the applicant may wish to submit concerning the subject-matter of the invention, for example further details of its advantages or of the problem it solves, and for which there is no basis in the application as filed, should be confined to the letter of reply rather than be incorporated into the application, Article 34(2)(b) PCT.

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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

HARMAN, Michael G.
HILLGATE PATENT SERVICES
No. 6 Aztec Row
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Islington, London N1 0PW
GRANDE BRETAGNE

RECEIVED

- 9 NOV 2001

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 07.11.2001

Applicant's or agent's file reference
./.

IMPORTANT NOTIFICATION

International application No.
PCT/IB00/01135

International filing date (day/month/year)
21/08/2000

Priority date (day/month/year)
25/08/1999

Applicant
BERLINLONDON LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
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Authorized officer

Buckley, D

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

409

Applicant's or agent's file reference ./.	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB00/01135	International filing date (day/month/year) 21/08/2000	Priority date (day/month/year) 25/08/1999
International Patent Classification (IPC) or national classification and IPC A47B61/00		
Applicant BERLINLONDON LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 18 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 23/03/2001	Date of completion of this report 07.11.2001 11/2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Papadimitriou, S Telephone No. +49 89 2399 2760 

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB00/01135

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-12 as received on 13/10/2001 with letter of 11/10/2001

Claims, No.:

1-10 as received on 13/10/2001 with letter of 11/10/2001

Drawings, sheets:

1/4-4/4 as received on 13/10/2001 with letter of 11/10/2001

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB00/01135

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-3
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-3
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-3
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB00/01135

Re Item I

Basis of the report

1) Independent claim 4

- 1.1) The amendments filed with the letter dated 11.10.01 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:

The passage in the last two lines of current claim 4 reading: "... and the door (20) **lies snug against** a compartment wall (13) when the door (20) is in the open position" cannot be clearly and unambiguously derived from the originally filed application. Figure 1 in isolation cannot provide basis for such an amendment. For the same reasons the passage at page 4, second paragraph also contravenes Article 34(2)(b) PCT.

- 1.2) Consequently, the scope of protection of claim 4 cannot be unequivocally determined. The subject-matter of claims 4 to 10 has not been considered when drafting the present international preliminary examination report.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1) State of the art

Reference is made to the following documents:

D1: US-A-5 135 293

D2: US-A-4 783 132

D3: FR-A-2 481 904

D4: US-A-5 039 179

D5: DE-C-360 666

D6: US-A-5 651 219

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2) Independent claim 1

Best prior art: Document D1, directed to a locker assembly 20, including at least "first" 24 and "second" 26 neighbouring lockers, cf. figs. 1 and 2, at least the "first" locker 24 including a body forming a compartment having an open side, cf. fig. 6, and a door 30 of **substantially** uniform cross section and of uniform curvature, cf. fig. 6, this curvature lying upon a circle, cf. fig. 6, the door 30 being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered, cf. col. 6, lines 1-10 and fig. 6, there being a cavity between said "first" and "second" lockers, cf. fig. 6, the door's 30 curve **remaining** lying upon the same said circle during rotation, cf. fig. 6, and the cavity being capable of accommodating the door 30 whilst the latter is in the open position.

Objective problem: To further develop the locker assembly of D1 to make more efficient use of the space inside the locker assembly.

Solution: The provision of a locker assembly comprising at least two lockers each formed from compartments walls, wherein the space between neighbouring compartment walls is used to accommodate a door of a locker when in the non-closing position.

Inventive step: In the assembly of D1 there exists no cavity between compartments walls of neighbouring lockers. In D1 the group of lockers is made up of a rigid hollow frame and semi-cylindrical doors.

D2 is not directed to a locker assembly but to a lockable cupboard, primarily intended for a bathroom.

D3 is directed to a single locker comprising slidable curved doors 1,3, cf. fig. 2.

D4 is directed to a locker assembly comprising a semi-cylindrical chamber 1 which accommodates a compartment 2 disposable therein and rotatable relative thereto.

The compartment 2 acts as a door member, but due to the fact that it is housed inside the chamber 1 the space available for housing articles is rather limited.

D5 discloses a locker assembly including a number of semi-cylindrical lockers housed within outer walls a,a, cf. fig. 2.

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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB00/01135

D6 is more remote as it is directed to a workspace module with curved doors and not to a locker assembly.

Industrial applicability: The claimed assembly is industrially applicable in the field of furniture equipment.

Consequently, the clarity objection raised in section VIII apart, the subject-matter of independent claim 1 complies with the provisions of Article 33, paragraphs (2)(3)(4) PCT.

3) Dependent claims 2 and 3

These dependent claims define various embodiments of the assembly specified in independent claim 1 and also comply with the provisions of Article 33 paragraphs (2)(3)(4) PCT.

Re Item VII

Certain defects in the international application

1) Description

According to the requirements of Rule 11.13(I) reference signs not appearing in the description shall not appear in the drawings, and vice versa. This requirement is not met in view of the reference signs 55, 56 and 57, cf. fig. 4.

Re Item VIII

Certain observations on the international application

1) Independent claim 1

- 1.1) In the claim in lines 6 and 7 at least one locker is specified as including compartment walls, which implies that there can be only one locker including compartment walls. In contrast, in lines 13-15 the cavity is specified as spanning between neighbouring compartment walls of the first and second lockers, which implies that at the least the "first" and "second" lockers must be equipped with

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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB00/01135

such compartment walls. Therefore, claim 1 does not comply with Article 6 PCT. The opinion set out in section V was based on the assumption that the latter construction was intended.

- 1.2) The term "generally" (line 8) is vague and indeterminate in scope as one of its interpretations is the term "usually" (Art. 6 PCT). The opinion set out in section V was based on the assumption that the term "substantially" was intended.

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Lockers

The present invention relates to lockers, that is, storage cubicles,
5 particularly, though not exclusively, arranged in rows.

A known type of locker comprises a cuboid body of five fixed
panels which form two side walls, a back wall, a top and a bottom, and a
hinged door which, when closed, forms the sixth face of the cuboid. The
10 body and door of the locker are conventionally made out of panels of sheet
metal. Such lockers are commonly stacked side-by-side in rows, with the
doors all similarly aligned and facing the same direction. Lockers are
found in many public or semi-public environments for people to
temporarily or indefinitely keep their belongings in. As their name implies,
15 lockers also commonly feature a locking means, typically a lock upon the
door which engages with a keep formed in the body of the locker.

The door of such a locker is hinged using one or more hinge plates
attached to the wall of the locker body and the door, the door being pivoted
20 about its vertical edge.

The hinge of the locker is vulnerable to many types of damage, such
as people carelessly over-opening the door, so that the part of the door
presses the edge of the side wall of the locker, whereupon the some part of
the hinge, or the door or body of the locker itself, may buckle and fail.
25 Another type of strain put upon the locker hinges is caused by people who
deliberately wish to cause damage to the locker by hanging upon the door,
so that again the hinge or the door may become bucked or broken. The

locker is often targeted by thieves, who will apply force upon the key hole, or between the gap between the edge of the door and the locker walls.

5 The provision of such lockers in confined spaces, especially in narrow corridors, may also give rise to difficulties, as there must be enough space for the doors of the lockers to open whilst still allowing other people past the row of lockers.

10 US 5135293 and WO 8801143 both show a locker featuring a pivoted curved door, the pivoting point being inside the concavity of the curve. Whilst being opened, the door does not swing significantly towards the user of the locker, and the door is not as prone to damage as the cuboid locker.

15 The curved shape of the door used in these lockers result in some disadvantages over conventional lockers. When a curved door is fitted upon a generally cuboid locker, the curved door impinges upon the volume of the locker when the door is opened; this can be seen in the cuboid cubicles having curved doors shown in US 5651219. In a locker, this can
20 result in the contents of the locker falling in the door's path when the locker is closed and jamming the door. Therefore, the shape of the body of the locker can be made to correspond to the curve of the locker, as in WO 8801143, and the bodies of the lockers arranged to attempt to waste as little space as possible, curved lockers being less efficient in that respect than
25 cuboid lockers. US 5135293 attempts to minimise the problem of the contents of the locker barring the door's path by providing a door which is, when considered in cross section, approximately $\frac{3}{4}$ of a complete circle, and supplying shelves upon the door. There is though still a possibility that the lockers contents could fall from the shelves and jam the locker; further,

a large amount of space is wasted between the substantially cylindrical volumes which may be used for storage.

US 4783132 shows a double cylinder shaped cupboard, having two
5 semi-cylindrical doors of similar curvature to the body of the cupboard. The interior of the cupboard is fully accessible. Both the interior and exterior are of an irregular shape, necessitating tailored shelving, and causing difficulty and inefficiency in fitting the cupboard in normal rectilinear surroundings. Also, the cupboard requires two doors and their
10 mechanisms for a single compartment, resulting in further expense and maintenance.

The object of the present invention is to provide a locker which is easy and efficient to manufacture, is spatially efficient, and alleviates other
15 problems of the prior art lockers.

According to the present invention there is provided A group of lockers, including at least first and second neighbouring lockers, at least the first locker including a body forming a compartment including
20 compartment walls and an open side, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment
25 is substantially uncovered, there being a cavity between neighbouring compartment walls of the first and second lockers respectively, the door's curve remains lying upon the same circle during rotation, and the cavity being capable of accommodating the door whilst it is in the open position.

Preferably the cavity, when considered from the front of the lockers, is covered by a covering member. Preferably the covering member includes a recess to accept the one edge of the door of the second locker.

- 5 According to another aspect of the invention, there is provided a locker or the like including compartment walls forming a substantially rectilinear compartment including an opening and a wall directly opposite that opening, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being rotatable from a closed position in which the open side of the compartment is substantially covered by the door and the door lies snug against a compartment wall when the door is in the open position.

- 15 Preferably the door is supported upon pivot means. The pivot means may be supplied by one or more generally segmental shapes pivoted about the apex of the segmental shape. Preferably a locking means to secure the door in the closed position acts upon the segmental shape. An extruded handle is provided on the door.

- 20 According to a further aspect of the invention, there is provided a group of lockers as herein defined.

- 25 Preferably there is provided a cavity between the bodies of at least first and second neighbouring lockers capable of accommodating the door of the first locker whilst it is in the closed position. Preferably the cavity, when considered from the front of the lockers, is covered by a covering member, which preferably includes a recess to accept the one edge of the door of the second locker.

It will be seen that a cuboid (or other non-cylindrical) volume may be provided behind a curved door, with almost no danger of any contents of the locker falling in the path of the door so as to jam the locker.

- 5 A locker and group of lockers embodying the invention will now be described, by way of example, with reference to the drawings of which;

Figure 1 is a plan view of two lockers,

- 10 Figures 2a and 2b are a side elevation and front elevation respectively of the locker, and

Figure 3 is a plan view of a locker in more detail,

- 15 Figure 4 is a plan view of another embodiment of a locker and portions of neighbouring lockers.

Referring to figures 1, 2a and 2b, each locker 10 comprises a cuboid body of five fixed planar rectangular surfaces which form two side walls 12,13, a back wall 15, a top 17 and a bottom 18, and curved door 20 of uniform cross section and curvature which is supported upon two hinge segments 25,26 which are pivoted about two pivot points on the body of the locker, an upper pivot point 28 on the locker's top, and a lower 29 on the locker's bottom. Referring to figures 2a and 2b, the top of the locker includes two spaced panels 32,33 and the bottom of the locker includes a panel 35 spaced from a plinth 36 which rests upon the ground. Between the spaced panels 32,33, and the panel 35 and plinth 36, the upper and lower hinge segments 25,26 are respectively accommodated.

The pivot point 28,29 of each hinge segment 25,26 is located at the centre of a circle upon which the door's curve lies. Thus when the door 20 is pivoted about these pivot points, it remains lying upon this circle as it is displaced. The pivot points, hinge segments and door are so arranged upon the body of the locker that the door may be swung between a closed position (as shown in the lower locker in figure 1) where it covers the open side of the locker and an open position where it permits full access to the open side of the locker (as shown in the upper locker in figure 1). The free edges of the side walls 12,13 of the locker (that is, two of the edges bounding the open side of the locker) lie somewhat inside the circle upon which the curve of the door 20 lies, and a chord joining the ends of the curve of the door is somewhat larger than the horizontal width of the open side. The door comes to a stop in its closed position when the side of the excised portion meets a buffer (not shown).

In order to open the door may be swung round about the pivot points, so that one edge of the door (that is, one end of the door's curve when considered in plan) comes to rest just before the side wall of the locker. For full access to the locker, the diameter of curvature of the door must be at least $1/2$ the width of the locker, so that the door is not impeded by the side wall of the locker whilst the other side of the door continues to block the open side of the locker. The diameter of curvature should not be chosen to be any larger than is necessary to allow full access, since the extent to which the door extends to the side of the locker whilst being swung open should also be kept to a minimum.

The hinge segment 25 is a generally segmental shape, having a triangular portion 31 excised from one side. On the opposite side of the hinge segment a keep 33 is incorporated, the keep engaging with a lock 34

when the door 20 is its closed position. The hinge segment 25, and the weight of the door, are supported by a nylon glider 38 attached to the lower surface of the upper segment 25, and which slides across the lower panel 33 of the two spaced panels which house the hinge segment. The lower hinge
5 segment 26 may be similarly provided with a nylon glider beneath it.

The upper and lower hinge segments 25,26 also ensure that the locker compartment is completely enclosed, and for this reason the excised portion 30 of the hinge segment must not be such that it allows any
10 substantial gap between the front edges of the top and bottom 17,18 of the locker on the one hand and the top and bottom edges of the door 20 on the other. Alternatively, the top and bottom of the locker could be shaped so as to include a curved portion to cover these areas.

15 The door also includes a handle 38 set upon the door's outer face (that is, its convex side), close to the trailing edge of the door (that is to say it's the edge which trails hindmost along the door's curvature as the door is swung open). The handle is a shaped rib of constant cross section projecting perpendicularly from the door, and is conveniently an extruded
20 plastics material. The handle runs vertically the whole height of the door, so that the door is convenient to open from a large range of heights. The door and handle may be extruded as a single, integral piece.

The lock 34 is operated by a proximity sensor upon the column
25 member (which is described below). In use, keys operating such sensors (for example, by infra-red or ultrasound coded signals) may be kept by the users of the lockers (where the users are to have long term use of the lockers) or may be lent on a short term basis to the users on payment of a deposit (for example, at a gymnasium). The proximity sensor is shielded so

as to be protected against vandals or thieves. The lock and key is in any case so configured that damage to the proximity sensor will not result in the lock being disengaged. The location of the lock, at the top of the locker beneath the upper panel of the locker top means that most opportunistic
5 thieves will be dissuaded from attempting unauthorised entry of the locker. The lock may be a mechanical lock, a motor driven bolt, or activated by a solenoid. A smart card could be used as a key, with a corresponding smartcard reader connected to the locker.

10 As shown in figure 1, a number of these lockers 10 are placed side by side in a row, set somewhat apart so that the each locker's door 20 may be accommodated in the space 21 between that locker and the neighbouring locker. A column member 40 is attached to one side of each locker to
15 enclose the space between the lockers and its neighbour. The column member 40 presents a concave curve between a pair of lockers when one is considered as facing the lockers, and includes a vertical recess 42 to accommodate the trailing edge of the door of its own locker, and a gap 43
20 between itself and the next locker to permit that lockers door to swing past (these features being shown best in figure 3). The column member is of constant cross section.

The two lockers at the either end of the row are provided with column members of slightly different design, one column member requiring only the retaining groove 42 to accept the edge of the door, and the other
25 column member requiring only the curved surface and gap 43 to cover the space occupied by the door in the open position. This space for the open door may be bounded by further panels, that is, a row end panel lying parallel to the lockers' side walls, and a panel extending in the same plane as the lockers' end panels. Alternatively, the lockers could be placed next

to one or more walls, the column member for the end locker being attached to the wall.

The column member includes the proximity sensor (not shown) by which the lock may be operated, and also an LED 45 embedded in the concavity of the column member which indicates when the lock is changing its state. The circuitry for the lock and sensor is located in the area bounded by the curved surface of the column member 40, a side wall 12 of one locker, and the curve of the door 20 (when in the closed position) of the neighbouring locker. This space, as well as other unutilised regions, such as the space bounded by the side wall of a locker and the curve of that same lockers door, and the remaining space between two side walls of neighbouring lockers, may be used to house other components, such as ventilation means (as described below), lighting means and the like.

15

On the side of the locker corresponding to the space where the open door is retained, the locker side has two excised regions 14 towards the front of the locker, these excised areas opening onto the regions between the locker top's spaced panels 32,33 and the locker bottom's plinth 36 and panel 35. These excised regions allow the top and bottom hinge segments 25,26 to swing over to the side of the locker as the door 20 is opened.

20

Along the back of the row of lockers, rear covering panels are attached to the locker backs, these panels lying in the plane of the lockers' backs, so as to cover the door retaining spaces when viewed facing the lockers' backs. Top covering panels lying in the plane of the lockers' tops similarly cover the door retaining spaces when viewed facing the lockers' tops. The rear covering panels and the panels making up the lockers' back 15 could be replaced by a single, integral panel. Similarly, the top covering

panels and the upper panels 32 of the top spaced panels could be replaced by a single, integral panel.

5 It will be seen that in contrast to the lock, keep, and hinge of a prior art locker, the pivoting and locking means of the present locker are largely inaccessible, whether the door is opened or closed, thus cutting down the scope of damage which may be performed by vandals. Furthermore, no leverage can be brought to bear upon the door or the pivoting means.

10 The door of the present locker, in opening to one side of the compartment, allows lockers to be positioned in locations in which a locker having a conventionally pivoted door would be unacceptably cumbersome and restrictive.

15 Referring now to figure 4, in a modification of the locker the back of the locker 10' comprises two curved members 50,51 and a grating 53, each of which extend through the full height of the locker. The grating is planar rectangular shape, and lies perpendicular to the locker's side walls. Each curved member 50,51 includes retaining groove 55 which accepts the
20 thickness of the sides walls so that each side wall 12,13 is joined to a curved member. The two curved members are similarly attached using grooves 56 to either side of the grate 53, securing it in place. The curved members thus, when considered in plan, 'round off' the rear corners of the previous embodiment of the locker 10.

25

A single, integral, panel 57 is erected to the rear of the row of lockers, so as to shield both the gratings 53 and the door retaining spaces 21'. The gratings 53 provide the lockers 10' with ventilation so that air in an individual locker does not become stale, as might occur for example

when the locker is used to store clothes. The ventilation may be enhanced by providing a fan system associated with the row of lockers, the unannotated arrows illustrating such a possible airflow.

5 Figures 2a and 2b also illustrates various components which may be included in the lockers, such as a grated towel shelf 60, a grated bag shelf 62, a glove box 64, and a coat hook 65. Naturally, many diverse elements or accessories could be included in such a locker.

10 Many of the parts of the locker may conveniently be extruded, since the have a uniform cross section. As well as the simple planar rectangular top panels 32,33, bottom panel 35, back 15 and walls 12,13 of the locker 10, the door 20, handle 38, column member 40, and curved back portions 51 of the embodiments shown herein could all be extruded, though
15 naturally, they could be manufactured by other techniques.

Various materials could be used, most ideally for extrusion purposes including plastic, laminated or otherwise toughened glass, and aluminium.

20 The dimensions of the locker will be dependent upon its intended use. For a locker for use in a gymnasium for example, the locker could be between about 250 mm to 400 mm wide, about 600 mm wide, and about 1.8 meters high. Smaller lockers, for example for person effects and stationary for use in schools and offices, overhead lockers in trains and
25 planes, or for apartment letter boxes, could be of the order of 250 mm cubed. Lockers of this size could be stacked one row on top of another. The lockers could of course be oriented so that the door pivots about a non-horizontal axis.

The same principle could also be applied to other types of compartment where a door is required with equal benefit, such as domestic cupboards and office filing cabinets, and even changing rooms and other cubicles.

5

CLAIMS

5 1. A group of lockers (10), including at least first and second
neighbouring lockers, at least the first locker including a body forming a
compartment including compartment walls (12, 13, 15) and an open side,
and a door (20) of generally uniform cross section and of uniform
curvature, this curvature lying upon a circle, the door (20) being supported
10 such that the door may be rotated from a closed position in which the open
side of the compartment is substantially covered by the door (20), to an
open position in which the open side of the compartment is substantially
uncovered, there being a cavity (21) between neighbouring compartment
walls of the first and second lockers respectively, the door's curve remains
15 lying upon the same circle during rotation, and the cavity (21) being
capable of accommodating the door (21) whilst it is in the open position.

2. A group of lockers (10) according to claim 1, wherein the cavity
(21), when considered from the front of the lockers, is covered by a
20 covering member (40).

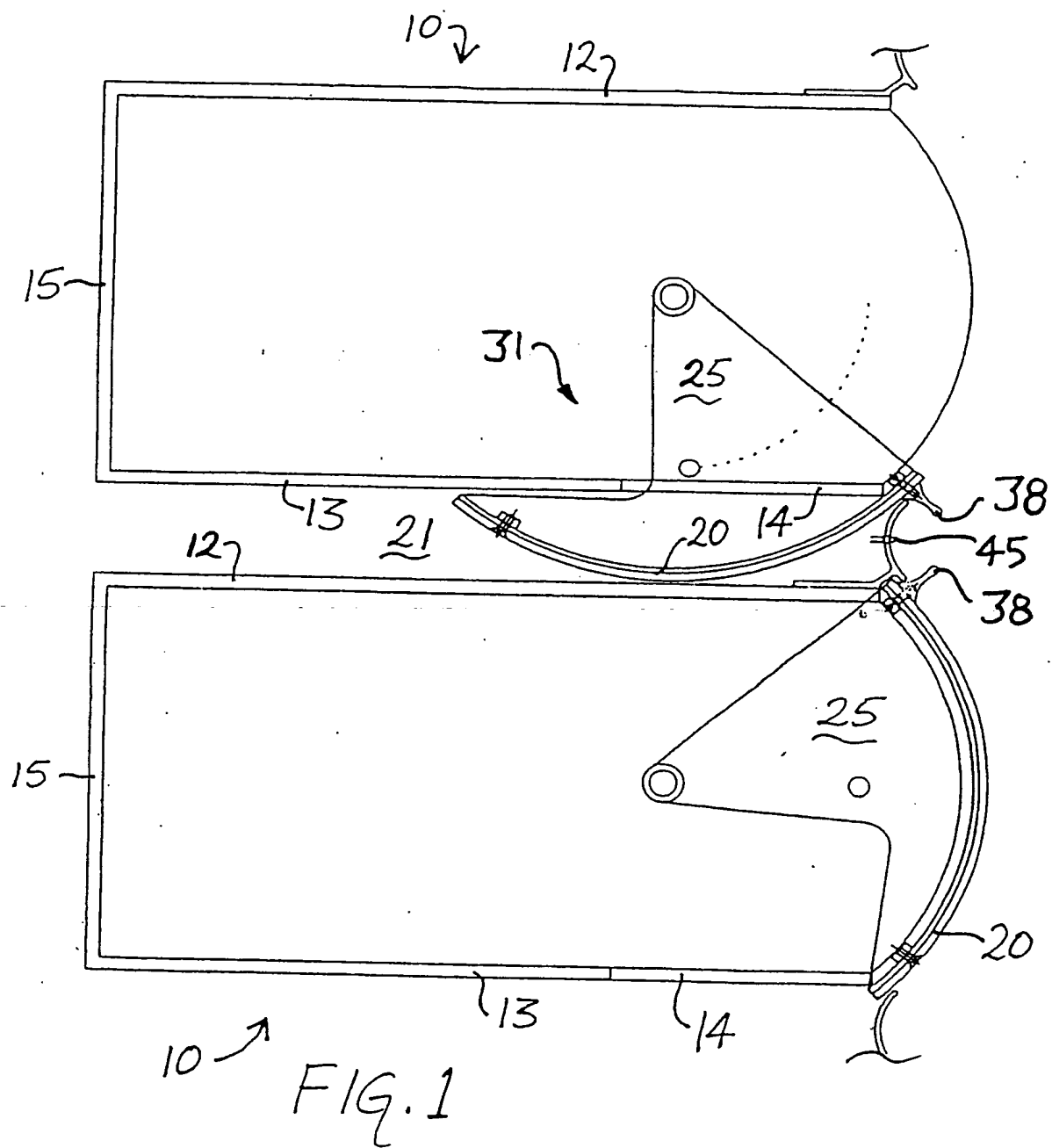
3. A group of lockers (10) according to claim 2, wherein the covering
member (40) includes a recess (42) to accept the one edge of the door (20)
of the second locker.

25

4. A locker or the like including compartment walls (12, 13, 15)
forming a substantially rectilinear compartment including an opening and a
wall (15) directly opposite that opening, and a door (20) of generally
uniform cross section and of uniform curvature, this curvature lying upon a

- circle, the door (20) being rotatable from a closed position in which the open side of the compartment is substantially covered by the door (20), to an open position in which the open side of the compartment is substantially uncovered, the door's curve remains lying upon the same circle during
- 5 rotation, such that the wall opposite the opening remains substantially uncovered by the door (20) and the door (20) lies snug against a compartment wall (13) when the door (20) is in the open position.
5. A locker or the like according to claim 4, wherein the door (20) is
- 10 supported upon pivot means (25, 28).
6. A locker or the like according to either of claims 4 or 5, wherein the pivot means (25, 28) is supplied by one or more generally segmental shapes (25) pivoted about the apex of the segmental shape (25).
- 15 7. A locker or the like according to any of claim wherein there is included a locking means (34) to secure the door (20) in the closed position.
8. A locker or the like according to claim 7 wherein the locking means
- 20 (34) act upon the segmental shape (25).
9. A locker or the like according to any of claims 4 to 8 wherein an extruded handle (38) is provided on the door (20).
- 25 10. A group of lockers (10) according to any of claims 4 to 9.

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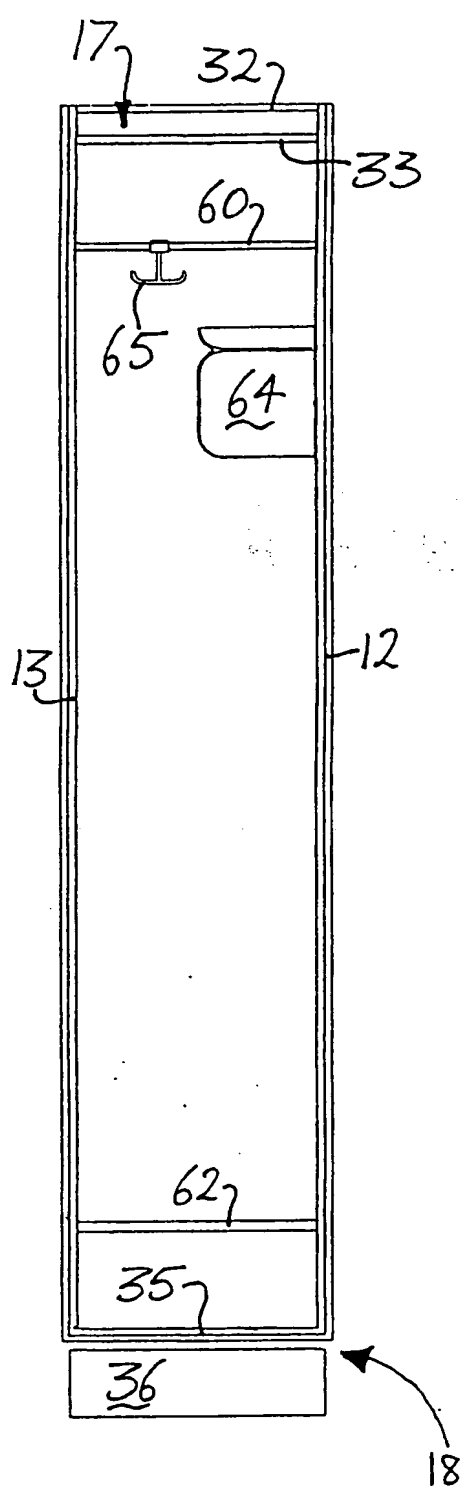


FIG. 2A

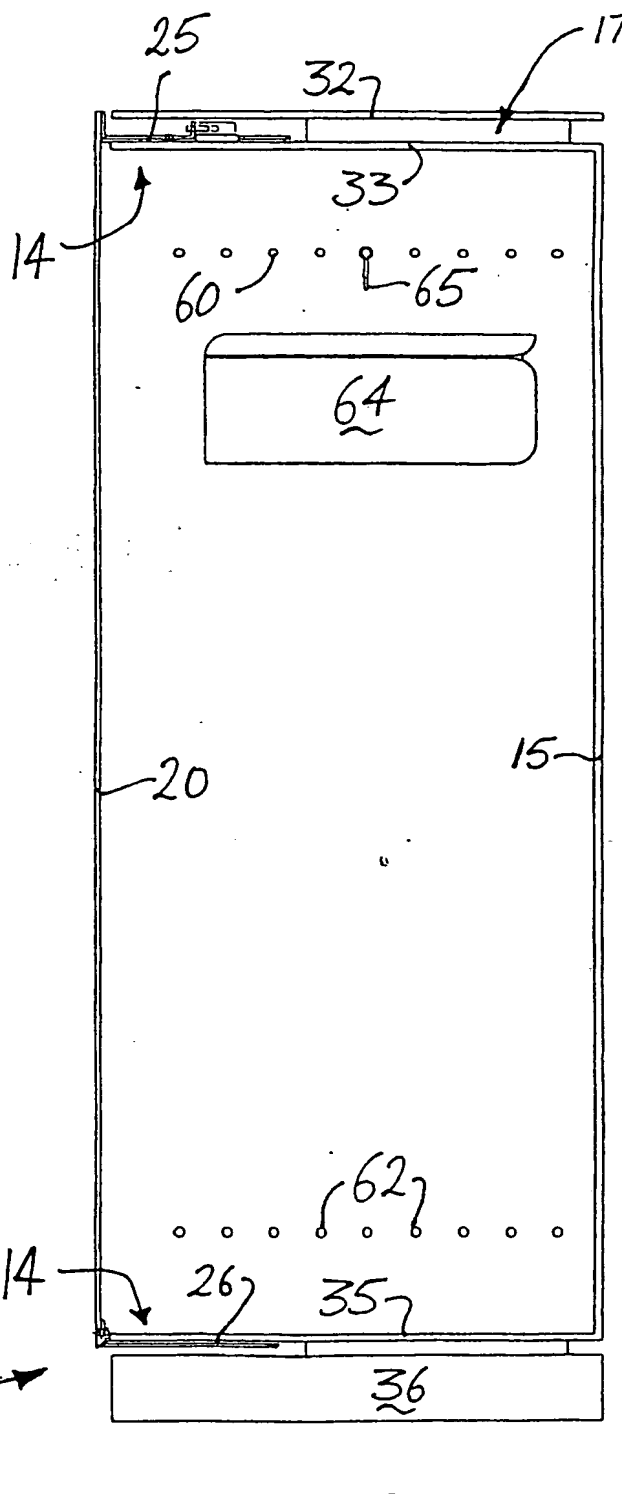
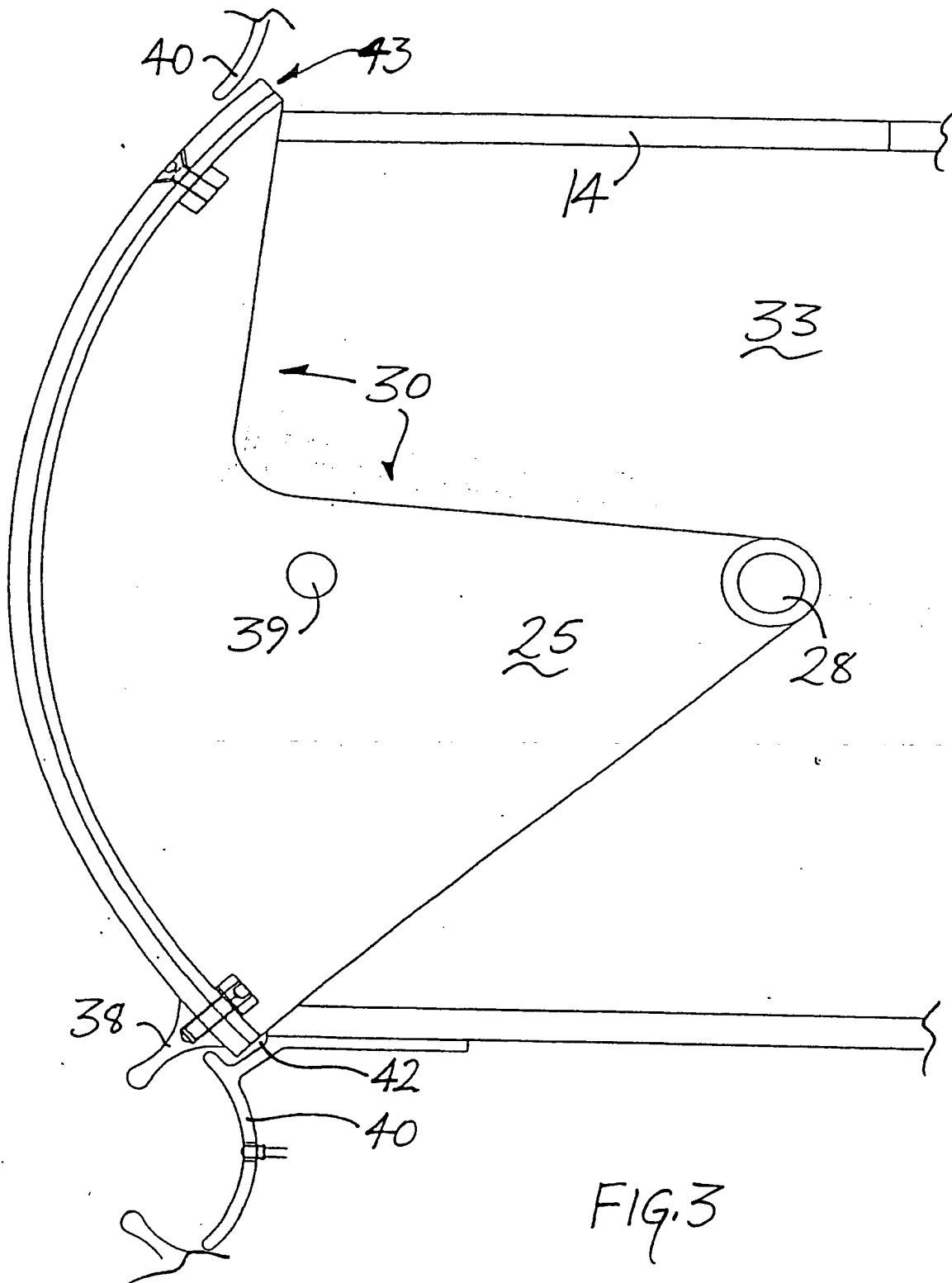


FIG. 2B

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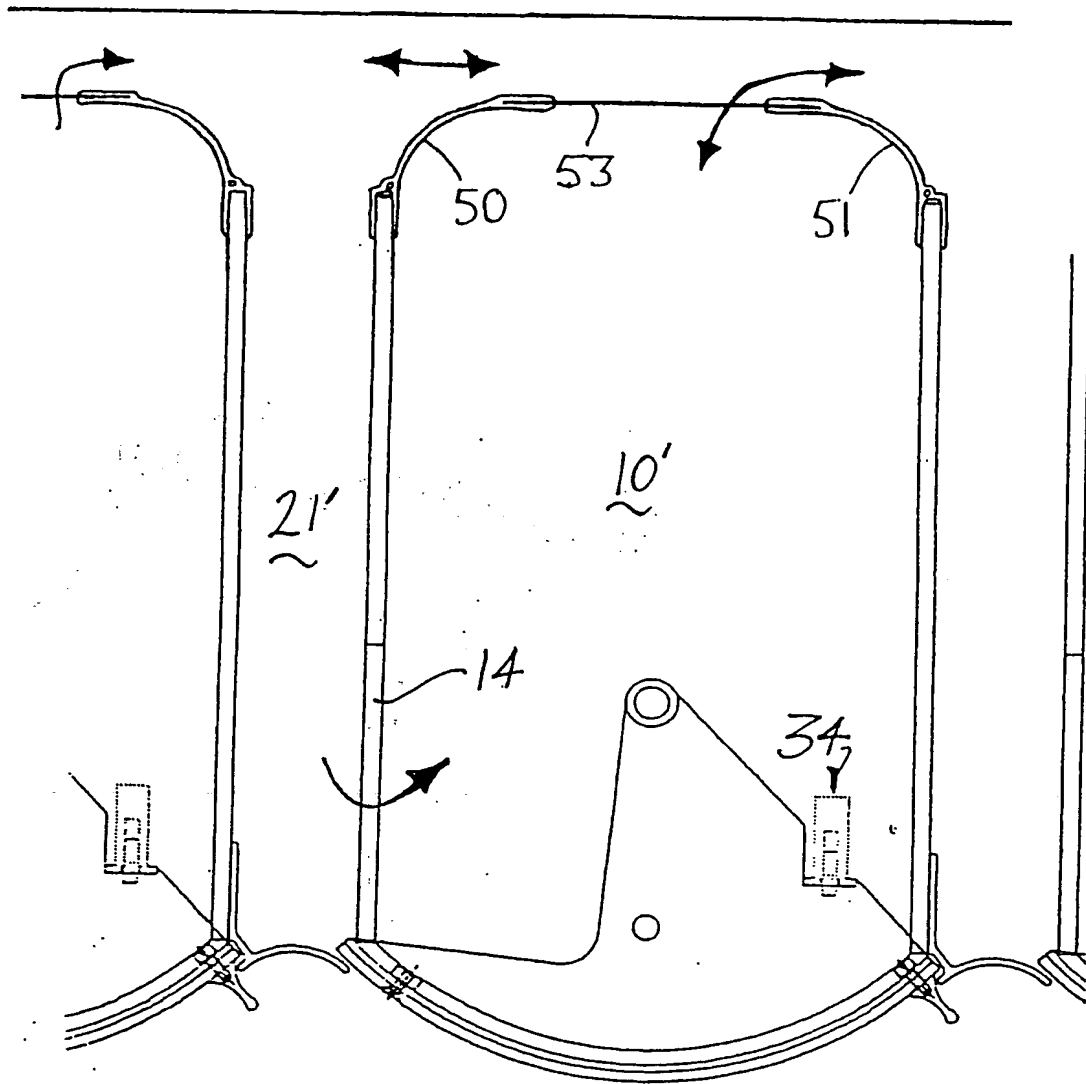


FIG. 4

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